



## Effects of alcohol consumption on plasma and urinary hormone concentrations in premenopausal women

---

**Author:** Reichman ME, Judd JT, Longcope C, Schatzkin A, Clevidence BA, Nair PP, Campbell WS, - Taylor PR

**Journal:** J Natl Cancer Inst 1993; 85(9):722-7 (Comment in: J Natl Cancer Inst 1993 May 5;85(9):692-3)

**Abstract:** BACKGROUND: Most epidemiologic studies of the relationship between alcohol consumption and breast cancer risk over the past decade have shown that persons who consume a moderate amount of alcohol are at 40%-100% greater risk of breast cancer than those who do not consume alcohol. Dose-response effects have been observed, but no causal relationship has been established. PURPOSE: This study examines the hypothesis that alcohol consumption affects levels of reproductive hormones. METHODS: A controlled-diet study lasting for six consecutive menstrual cycles was conducted. Participants were randomly assigned to two groups, and a crossover design was used. During the last three menstrual cycles, alcohol consumption of the two groups was reversed. Thirty-four premenopausal women, aged 21-40 years, with a history of regular menstrual cycles, consumed 30 g of ethanol (equivalent to approximately two average drinks) per day for three menstrual cycles and no alcohol for the other three. All food and alcohol consumed were provided by the study. Caloric intake was monitored to ensure that each woman would maintain body weight at approximately the baseline level. Hormone assays were performed on pooled plasma or 24-hour urine specimens collected during the follicular (days 5-7), peri-ovulatory (days 12-15), and mid-luteal (days 21-23) phases of the third menstrual cycle for subjects on each diet. RESULTS: Alcohol consumption was associated with statistically significant increases in levels of several hormones. Plasma dehydroepiandrosterone sulfate levels were 7.0% higher in the follicular phase ( $P = .05$ ). In the peri-ovulatory phase, there were increases of 21.2% ( $P = .01$ ) in plasma estrone levels, 27.5% ( $P = .01$ ) in plasma estradiol levels, and 31.9% ( $P = .009$ ) in urinary estradiol levels. In the luteal phase, urinary estrone levels rose 15.2% ( $P = .05$ ), estradiol levels increased 21.6% ( $P = .02$ ), and estriol levels rose 29.1% ( $P = .03$ ). No changes were found in the percent of bioavailable estradiol, defined by the sum of percent free estradiol and percent albumin-bound estradiol. However, increased total estradiol levels in the peri-ovulatory phase suggest elevated absolute amounts of bioavailable estradiol. CONCLUSION: This study has shown increases in total estrogen levels and amount of bioavailable estrogens in association with alcohol consumption in premenopausal women. IMPLICATION: This possible explanatory mechanism for a positive association between alcohol consumption and breast cancer risk merits further investigation.